The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EDWIN PETER DAWSON PEDNAULT

Appeal No. 2005-0772
Application 09/302,154

ON BRIEF

Before THOMAS, RUGGIERO, and LEVY, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellant has appealed to the Board from the examiner's final rejection of claims 1 through 20.

Representative claim 19 is reproduced below:

19. A method of at least one of managing and providing consultation for financial decisions, said method comprising at least one of generating, transmitting, receiving, and forwarding a report executed by a computer, said computer having executed a program of instructions to perform a method for constructing segmentation-based models that satisfy constraints on the

statistical properties of the segments, the method executed by said machine comprising:

(1) presenting, to a computer, a collection of training data records comprising examples of input values that are available to a model, together with the corresponding desired output value(s) that the model is intended to predict; and

(2) based on said training data, automatically generating, on said computer, a plurality of segment models, that together comprise an overall model, wherein each segment model is associated with a specific segment of the training data, said generating comprising performing optimization comprising:

a) generating alternate training data segments and associated segment models;

b) evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint; and

c) selecting a final plurality of segment models and associated segments from among the alternates evaluated that satisfy said statistical constraints.

The following references are relied on by the examiner:

Simoudis et al. (Simoudis)	5,692,107	Nov. 25, 1997
Apte et al. (Apte)	5,970,464	Oct. 19, 1999 (filed Sep. 10, 1997)

Claims 19 and 20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Apte. Claims 1 through 18 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Apte in view of Simoudis.

Rather than repeat the positions of the appellant and the examiner, reference is made to the Brief and Reply Brief for appellant's positions, and to the Answer for the examiner's positions.

OPINION

We reverse both stated rejections of the claims on appeal essentially for the reasons set forth by appellant in the Reply Brief.

Inasmuch as the discussion regarding the issues in this appeal has been somewhat clouded during the prosecution history and as expressed in the principal Brief and Answer, we initially reproduce this portion of the Specification beginning at page 33, line 20, through page 34, line 30, which makes reference to the prior art showing in Figure 2 and the inventor's contribution in Figure 3:

> An important aspect of the present invention that distinguishes it from prior art methods is the fact that statistical constraints are applied as an integral part of the method for splitting larger segments into smaller segments. Statistical constraints are applied as splits are being constructed in order to guide the construction process. In sharp contrast,

prior art methods . . . apply corresponding statistical contraints only after splits have been constructed. This methodology is illustrated in Figure 2. A deficiency of this prior art method is that splits may be constructed that violate the statistical constraints, causing them to be eliminated from further consideration, even though it may have been possible to construct alternate splits that actually do satisfy the statistical constraints.

By using the statistical constraints to guide the construction of splits, our method is able to produce splits that satisfy the statistical constraints whenever it is feasible to do so. Our method thereby avoids premature termination of the segment refinement process caused by poor choices made during the construction of splits.

The above distinction between the present invention and prior art is analogous to the distinction between closed-loop and open-loop control systems . . . . The prior art approach is open-loop in the sense that the statistical constraints, which play the role of error signals, are evaluated only after the splits have been constructed (see Figure 2). Poor choices made during the construction of the splits can result in segments that violate the statistical constraints even though it may have been possible to construct splits that satisfy the constraints. In the case of the present invention, on the other hand, the statistical constraints are repeatedly evaluated while constructing splits to determine whether or not they hold, and the results of the evaluations are used to regulate the construction process. This closed-loop

> methodology which is illustrated in Figure 3, ensures that the statistical constraints will be satisfied whenever it is feasible to do so.

In a corresponding manner, we find that the subject matter distinguished in Figure 3 over the prior art approached in Figure 2 has been set forth in each independent claim on appeal in various degrees of breadth and specificity. It is only independent claim 2 that directly recites the use of the earlier-noted closed-loop arrangement, depicted to the top left of Figure 3, of the claims on appeal. Claim 1 reflects the corresponding subject matter recited in independent claim 19, making special note of subclause b) of evaluating at least one generated segment to determine whether it satisfies at least one statistical constraint, and the concluding recitation in subclause c) of selecting a final plurality of segment models and associated segments from among the alternates just evaluated that satisfy at least one of the statistical constraints. It is this evaluation and selection stage that is reflective of the evaluation of statistical constraints closed-loop features depicted in Figure 3 and discussed in the earlier noted portion of the specification.

Independent claim 3 has corresponding features of generating alternate pluralities as well as a feature of adjusting the alternate pluralities so that the resulting data segments satisfy the statistical constraints. In like fashion, independent claim 4 contains a corresponding generating clause with a comparable clause to the evaluation feature earlier noted of comparing said alternate pluralities of segment models using statistical likelihood scores based upon statistical models of insurance risk. Independent apparatus claim 14 recites the generation of alternate training data segments where each of said generated segments having been evaluated to determine whether it satisfies at least one statistical constraint are followed by a selection of a final plurality of data segments from those alternates already evaluated. In a slightly broader recitation, the subject matter of independent apparatus claim 16 corresponds to that of claim 14 where it appears that the language "having been evaluated" recited in subclause a) in claim 14 has been left out of the generating clause in claim 16 but has been indirectly referred to in the selecting clause at the end of the claim.

This discussion therefore focuses upon the notion that each independent claim on appeal in some way reflects appellant's contribution in the art.

From our study of the Answer, it appears to us that the examiner's best statement of the rejection, which in turn focuses upon the corresponding clauses of each independent claim on appeal, is the following paragraph at page 23 in the responsive arguments portion of the Answer:

> [T]he Examiner maintains giving the term "statistical constraint" its common meaning, and, as such, Apte's actual premium clearly is a statistical constraint. As explained above and incorporated herein, Apte's actual premium has a value of $350 in the cited passage and therefore clearly is statistical in nature. Furthermore, a constraint is defined as the "state of being checked or restricted" (See definition of "constraint" Webster's dictionary 10th edition, page 248, attached at the end of the Examiner's Answer). As such, it is respectfully submitted that Apte's actual premium that is used to evaluate the generated segments and restrict which segments are included in the final plurality of segments, is clearly a constraint. Therefore, the Examiner maintains that Apte teaches a "statistical constraint."

Although this last quoted paragraph is reflective of what appears to us to be the examiner's clearest recitation of the correlation of Apte to the claims on appeal, overall, we find

the examiner's position in the Answer to be strained, speculative and not consistent with the art as viewed from the perspective of one of ordinary skill in the art.

We therefore reproduce here a lengthy discussion of appellant's views expressed in the Reply Brief which appear to bring into proper perspective, and are consistent with our own views of the disclosed and claimed invention, the applied prior art and the issues before us for decision on appeal:

> (C) On pages 20-22 [of the Answer], as best understood, the Examiner confirms that he does indeed intend for "statistical constraint" to be satisfied by the "actual premium".
>
> The Examiner states:
>
> *"The cited passage by the Examiner states that "the end user can now examine each of these segments and their estimated pure premiums. For example, if the product's actual premium is $350, and segments that fall within the eligibility list and whose estimated pure premiums are significantly higher than this figure are candidates for exclusion from the product." (Apte; col. 4, lines 38 [sic, 28]-33). As such, the cited passage reaffirms that estimated pure premiums of segments are evaluated against an actual premium (i.e., statistical constraint) to select a final plurality of segments. As indicated by Appellant, the Examiner maintained that the cited passage of Apte clearly suggested the "statistical constraint" having a value of $350 and was*

not predicted but entered by the user as the desired quarterly premium (Apte; col. 4, lines 9-16 and 28-33)....

...Furthermore, as pointed out by Appellant on pages 8 and 13 of Appellant's brief, the Examiner has indicated throughout the record the Examiner has interpreted the variable that has a value of $350 as the "statistical constraint." It is respectfully noted, that in Apte the only variable having such a value is the "actual premium"." (emphasis by Appellant)

Appellant respectfully replies that the above statement indicates some basic confusion by the Examiner. First, it is noted that the actual premium of $350 is not used in Apte as a variable and it is not "... entered by the user as the desired quarterly premium."

Rather, the actual premium is the amount actually being charged for the product being analyzed. In Apte, it has a single exemplary value (e.g., $350). Accordingly, it is not a variable. It is a datum already associated with the product under analysis. Moreover, by reason of being a single number associated with the product under analysis, it is not statistical in any way.

The cited passage does nothing more than instruct the user to compare this single value (e.g., actual premium) with the estimated pure premium for each segment. If the user considers that the estimated pure premium is "significantly higher" that [sic] the amount actually charged for the product, then that segment can be selectively eliminated. This selective removal of a

segment from the model is an entirely different concept from that of the plain meaning of the claim language that the segment be evaluated during its generation to determine whether it satisfies a statistical constraint. This aspect of the present invention provides a "closed loop" for the generation of the segments.

Second, the above-recited description by the Examiner ("*... that estimated pure premiums of segments are evaluated against an actual premium (i.e., statistical constraint) to select a final plurality of segments ...*") is not what the plain meaning of the claim language requires, since the statistical constraint is clearly applied during the generation of the segments, not for purpose of eliminating the segment from the model, as is done in Apte.

(D) On pages 22-23 [of the Answer], the Examiner addresses Appellant's request that the Examiner provide a reasonable reference supporting his position for "statistical constraint". It is noted that the Examiner has finally (e.g., as part of the Examiner's Answer), in the entire prosecution history, felt obliged to defend that any term in Apte can reasonably be considered as a "statistical constraint".

The Examiner first alleges that the specification fails to define this term.

In response, Appellant submits that "statistical constraint" is a term of art in the actuarial art that addresses the concern discussed on pages 1 and 2 of identifying whether homogenous risk groups are "actuarially credible". This point is expressly highlighted in lines 2-5 of page 3:

"In the case of insurance risk modeling, the segments would correspond to risk groups and the constraints would correspond to criteria used by actuaries to assess actuarial credibility."

Thus, Appellant submits that the specification does indeed define this concept.

Moreover, contrary to the Examiner's allegation, specific examples for "statistical constraints" are clearly provided in the specification between line 30 of page 93 and line 6 of page 94 (e.g., Equation 15 for insurance risk or profitability modeling using joint Poisson/log-normal models, and Equation 64 for weighted least-squares models).

Thus, the Examiner is not free to consider that "statistical constraint" refers to any parameter that happens to be used as a selection constraint, as long as the parameter can summarily be declared as having some type of statistical characteristics.

Second, it is again noted that the Examiner's own wording ("*... it is respectfully submitted that Apte's actual premium that is used to evaluate the generated segments and restrict which segments are included in the final plurality of segments, is clearly a constraint.*") is not what the plain meaning of the claim language requires.

That is, the statistical constraint is required to be used in the generation process of the segments. Apte does not have a corresponding segment generation step that uses statistical constraints to guide the process of generating the segments.

The generation of the segments in Apte is clearly described at lines 23-27 of column 4: *"When the data mining rules are applied to this subset, the rules will break up the eligibility subset into as many segments as there are rules ...."*

Thus, in Apte, the segments are equivalent to the rules extracted by the data mining process. These segments are not changed during the interaction with the user. Morever, there clearly is no statistical constraint applied to this generation of segments, in which segments are defined in accordance with the rules extracted during data mining.

Third, it is noted that the Examiner clearly does nothing except make a conclusory declaration with this statement in the first full paragraph on page 23: "... As explained above and incorporated herein, Apte's actual premium has a value of $350 in the cited passage and therefore clearly is statistical in nature."

Appellant respectfully submits that the single exemplary value of $350 does not in any way provide a basis to summarily declare that an insurance actual premium is somehow "statistical in nature".

Moreover, as explained above, the term "statistical constraint" is a term of art in the actuarial art, as explained in the specification. An insurance policy actual premium is the price being paid for the policy. It is clearly not a "criterion used by actuaries to assess actuarial credibility" for either the policy or for population

segments covered by the policy. The exemplary segment generation process of the present invention, described beginning at line 10 of page 89, preferably starts with a single segment (e.g., see lines 9-12 of page 90). This initial segment is then systematically broken down into two or more segments in each generation cycle, as described beginning at line 14 of page 90. As explained beginning at line 24 of page 93, remaining segments are tested to determine whether they satisfy the desired statistical constraints for segments (e.g., Equation 15 for joint Poisson/log-normal models and Equation 64 for weighted least-squares models).

In contrast, Apte does not have a corresponding segment generation process. Indeed, as clearly defined at lines 23-29 of column 4, Apte has a single set of segments for any specified subset, and this single set of segments is determined by applying the rules extracted from the data mining process. There is no segment generation proces in Apte other than the fixed set of segments determined from these rules.

The user merely takes these fixed segments and decides whether the difference between the actual premium and the estimated pure premium for that segment is "significantly high" to eliminate that segment. However, this segment elimination process is not a segment generation process, let alone a process based on determining whether the segment satisfies a statistical constraint that is a criterion used by actuaries to assess actuarial credibility.

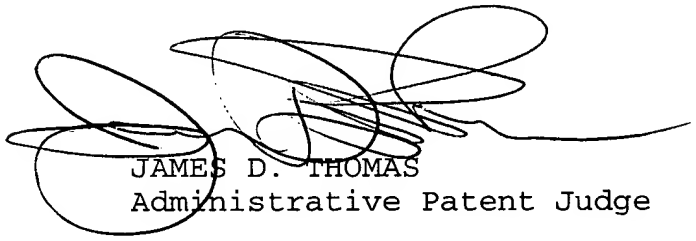
That is, unlike the fixed segment set in Apte, the present invention automatically

> generates a set of segments in a closed loop technique that is based on actuarial credibility. The user-assisted model in Apte has a fixed set of segments, and these segments that have not been evaluated for actuarial credibility. The selection by the user to eliminate specific segments does not in any way provide any more actuarial credibility either to any of the segments remaining or to the resultant modified model.

In view of the foregoing, we conclude that the examiner has not established a prima facie case of anticipation of independent claim 19 and its dependent claim 20 within 35 U.S.C. § 102 and has as well not established a prima facie case of obviousness of claims 1 through 18 on appeal. The examiner's reliance upon Simoudis does not make up for the deficiencies noted with respect to Apte's teachings and suggestions. Essentially, we do not agree with the examiner's extremely broad and apparently non-art-based view of what a "statistical constraint" is within Apte. It is also plain to see that any type of statistical constraint that may be viewed by the artisan as being taught in Apte is not done during the generation of the segments. The statistical constraint is plainly required by each claim to be used as part of an evaluation process in the generation of the segments for which there are no corresponding features in Apte.

Therefore, the decision of the examiner rejecting various claims under 35 U.S.C. § 102 and 35 U.S.C. § 103 is reversed.

REVERSED



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